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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,563	11/20/2003	Dae-Seob Kweon	102-1011	7056

38209 7590 01/22/2007
STANZIONE & KIM, LLP
919 18TH STREET, N.W.
SUITE 440
WASHINGTON, DC 20006

EXAMINER

LEE, SUSAN SHUK YIN

ART UNIT	PAPER NUMBER
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2852

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/716,563

Applicant(s)

KWEON, DAE-SEOB

Examiner

Susan S. Lee

Art Unit

2852

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-14 and 22-28 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 15-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

Claims 1-6 and 26-28 are objected to because of the following informalities:

As to claim 1, line 6, "the toner receptacle" lacks antecedent basis.

Appropriate correction is required.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 7-14, and 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirano et al. (2002/0191990) in view of Sakai et al. (6,353,720).

Hirano et al. discloses a photosensitive member 1 and a developing apparatus 6. Note page 13, paragraph [0182]. The developing apparatus 6 has tank 25 holding toner 24; developing roller 20; and a toner supply member 22 that is a fur brush. Note page 4 – page 5, paragraph [0075] and Fig. 1.

Hirano et al. differs from the instant invention by not disclosing a cleaning unit to remove toner from the toner supplying roller that remains after the toner is transferred from the toner supplying roller to the developing roller.

Sakai et al. discloses a developing unit 4, a toner receptacle 40, a developing roller 41, a toner supplying roller 42, and a cleaning roller 45 that removes the toner

from the toner supplying roller 42 (note Fig. 12B). Note column 15, lines 5-50; column 23, lines 23-67; and Fig. 13. Since the cleaning roller 45 contacts the supplying roller 42, the movement between the two rollers caused by friction must somehow shake a portion of the toner supplying roller 42. Sakai et al. discloses in Fig. 4 that the toner supplying roller 42 supplies toner to the developing roller 41 while scraping the toner after development. When the developing roller 41 stops as the development is completed, toner supplying roller 42 is also stopped. Therefore, the toner held at that nip between the rollers may stick to the developing roller's 41 surface and the toner supplying roller's 42 surface. The toner that is trapped will cause strips or white voids during development. Note column 3, lines 9-25. The toner residing between the developer roller 41 and the toner supplying roller 42 can be positively removed (note column 8, lines 21-30). Thus, using a cleaning roller 45 that removes the toner from the toner supplying roller would prevent this from occurring. The developing roller 41 contacts the photoreceptor 1 (Note column 1, lines 58-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Hirano et al. with that of Sakai et al. by using a cleaning roller to clean off the fur brush roller of Hirano et al. to prevent strips or white voids during development.

Claims 1-4, 7-14, and 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (6,381,434) in view of Sakai et al. (6,353,720).

Yamamoto discloses a photosensitive member 10 and a developing apparatus 3. The developing apparatus 3 has a receptacle holding developer and toner; developing

Art Unit: 2852

roller 1; and a toner supply member 4 that is a fur brush. The toner supply brush 4 is made of a fur brush flocking a core of SUS or the like with conductive fibers made of polyamide (nylon). The size of the fibers are of 1 – 10 denier/filament and the length is from 1- 10 mm. Note column 4, line 46 – column 5, line 8 and Fig. 1.

Yamamoto differs from the instant invention by not disclosing a cleaning unit to remove toner from the toner supplying roller that remains after the toner is transferred from the toner supplying roller to the developing roller.

Sakai et al. discloses a developing unit 4, a toner receptacle 40, a developing roller 41, a toner supplying roller 42, and a cleaning roller 45 that removes the toner from the toner supplying roller 42 (note Fig. 12B). Note column 15, lines 5-50; column 23, lines 23-67; and Fig. 13. Since the cleaning roller 45 contacts the supplying roller 42, the movement between the two rollers caused by friction must somehow shake a portion of the toner supplying roller 42. Sakai et al. discloses in Fig. 4 that the toner supplying roller 42 supplies toner to the developing roller 41 while scraping the toner after development. When the developing roller 41 stops as the development is completed, toner supplying roller 42 is also stopped. Therefore, the toner held at that nip between the rollers may stick to the developing roller's 41 surface and the toner supplying roller's 42 surface. The toner that is trapped will cause strips or white voids during development. Note column 3, lines 9-25. The toner residing between the developer roller 41 and the toner supplying roller 42 can be positively removed (note column 8, lines 21-30). Thus, using a cleaning roller 45 that removes the toner from the

toner supplying roller would prevent this from occurring. The developing roller 41 contacts the photoreceptor 1 (Note column 1, lines 58-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Yamamoto with that of Sakai et al. by using a cleaning roller to clean off the fur brush roller of Hirano et al. to prevent strips or white voids during development.

Allowable Subject Matter

Claims 5, 6, and 15-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 11/2/06 have been fully considered but they are not persuasive.

1. Claim 1

Applicant argues the reference to Sakai teaches away from the limitations to claim 1 such as "a cleaning unit disposed at a position opposite to the predetermined nip with respect to a rotating axis of the toner supply roller to remove from the toner supplying roller the toner which remains after the toner is transferred from the toner supplying roller to the developing roller". This is incorrect. Although Sakai teaches the cleaning roller 45 is provided to supply the toner to the supplying roller 42, it is only during the time of development that this is true, shown in Fig. 12A (note column 24, lines 1-45). After development, there will be toner left remaining on developing roller 41

Art Unit: 2852

at its nip with toner supplying roller 42 (note column 25, lines 1-18). This may cause the toner to stick at that area, thus interfering with charging of the toner further making the development worse for the next operation. In order to eliminate this, the bias voltages applied to the toner supplying roller 42 and cleaning unit 45 are switched, reversing the direction of the electric fields that drive the toner at a period after development. This results in toner being efficiently removed by cleaning unit 45 between the contact point of cleaning unit 45 and toner supplying roller 42 as well as the contact point of cleaning unit 45 and regulating roller 43. Note column 25, line 1 – column 26, line 14. In addition, Sakai describes that after development, “the toner **residing** between the developing roller and the toner supplying roller ... can be positively removed and hence the toner that is trapped is excluded” (note column 8, lines 15-27). This toner **residing** between the developing roller and the toner supplying roller reads on the instant invention’s “toner which remains after the toner is transferred from the toner supplying roller to the developing roller”. The controller switches the level of the bias voltage applied to the cleaning unit so that the directions of the electric fields acting on the toner, formed between the toner supplying roller and the cleaning unit, after switching are opposite to those formed during development. Therefore, this configuration enhances the toner removal effect of excluding the toner from the nip between the cleaning unit 45 and the toner supplying roller 42. Note column 8, lines 16-44. This is shown in Fig. 12B.

2. Claim 7

Applicant argues that Sakai does not teach or suggest "a cleaning roller to remove the toner from the toner supplying roller", as recited by claim 7. Examiner disagrees. Although Sakai teaches the cleaning roller 45 is provided to supply the toner to the supplying roller 42, it is only during the time of development that this is true, shown in Fig. 12A (note column 24, lines 1-45). After development, there will be toner left remaining on developing roller 41 at its nip with toner supplying roller 42 (note column 25, lines 1-18). This may cause the toner to stick at that area, thus interfering with charging of the toner further making the development worse for the next operation. In order to eliminate this, the bias voltages applied to the toner supplying roller 42 and cleaning unit 45 are switched, reversing the direction of the electric fields that drive the toner at a period after development. This results in toner being efficiently removed by cleaning unit 45 between the contact point of cleaning unit 45 and toner supplying roller 42 as well as the contact point of cleaning unit 45 and regulating roller 43. Note column 25, line 1 – column 26, line 14. In addition, Sakai describes that after development, "the toner **residing** between the developing roller and the toner supplying roller ... can be positively removed and hence the toner that is trapped is excluded" (note column 8, lines 15-27). This toner **residing** between the developing roller and the toner supplying roller reads on the instant invention's "toner which remains after the toner is transferred from the toner supplying roller to the developing roller". The controller switches the level of the bias voltage applied to the cleaning unit so that the directions of the electric fields acting on the toner, formed between the toner supplying roller and the cleaning

unit, after switching are opposite to those formed during development. Therefore, this configuration enhances the toner removal effect of excluding the toner from the nip between the cleaning unit 45 and the toner supplying roller 42. Note column 8, lines 16-44. This is shown in Fig. 12B.

3. Claim 23

Applicant argues that Sakai does not teach or suggest “a cleaning unit to shake the fur of the toner supplying roller to remove the toner from the toner supply roller”, as recited by claim 23. Examiner disagrees. Although Sakai teaches the cleaning roller 45 is provided to supply the toner to the supplying roller 42, it is only during the time of development that this is true, shown in Fig. 12A (note column 24, lines 1-45). After development, there will be toner left remaining on developing roller 41 at its nip with toner supplying roller 42 (note column 25, lines 1-18). This may cause the toner to stick at that area, thus interfering with charging of the toner further making the development worse for the next operation. In order to eliminate this, the bias voltages applied to the toner supplying roller 42 and cleaning unit 45 are switched, reversing the direction of the electric fields that drive the toner at a period after development. This results in toner being efficiently removed by cleaning unit 45 between the contact point of cleaning unit 45 and toner supplying roller 42 as well as the contact point of cleaning unit 45 and regulating roller 43. Note column 25, line 1 – column 26, line 14. In addition, Sakai describes that after development, “the toner **residing** between the developing roller and the toner supplying roller ... can be positively removed and hence the toner that is trapped is excluded” (note column 8, lines 15-27). This toner **residing** between the

Art Unit: 2852

developing roller and the toner supplying roller reads on the instant invention's "toner which remains after the toner is transferred from the toner supplying roller to the developing roller". The controller switches the level of the bias voltage applied to the cleaning unit so that the directions of the electric fields acting on the toner, formed between the toner supplying roller and the cleaning unit, after switching are opposite to those formed during development. Therefore, this configuration enhances the toner removal effect of excluding the toner from the nip between the cleaning unit 45 and the toner supplying roller 42. Note column 8, lines 16-44. This is shown in Fig. 12B. Also, since the cleaning roller 45 contacts the supplying roller 42, the movement between the two rollers caused by friction must somehow shake a portion of the toner supplying roller 42.

4. Claim 24

Applicant argues that Sakai does not teach or suggest "removing residual toner remaining on the toner supplying roller with a cleaning roller after the toner supplying operation, as recited by claim 24. Examiner disagrees. Although Sakai teaches the cleaning roller 45 is provided to supply the toner to the supplying roller 42, it is only during the time of development that this is true, shown in Fig. 12A (note column 24, lines 1-45). After development, there will be toner left remaining on developing roller 41 at its nip with toner supplying roller 42 (note column 25, lines 1-18). This may cause the toner to stick at that area, thus interfering with charging of the toner further making the development worse for the next operation. In order to eliminate this, the bias voltages applied to the toner supplying roller 42 and cleaning unit 45 are switched, reversing the

Art Unit: 2852

direction of the electric fields that drive the toner at a period after development. This results in toner being efficiently removed by cleaning unit 45 between the contact point of cleaning unit 45 and toner supplying roller 42 as well as the contact point of cleaning unit 45 and regulating roller 43. Note column 25, line 1 – column 26, line 14. In addition, Sakai describes that after development, “the toner **residing** between the developing roller and the toner supplying roller ... can be positively removed and hence the toner that is trapped is excluded” (note column 8, lines 15-27). This toner **residing** between the developing roller and the toner supplying roller reads on the instant invention’s “residual toner remaining on the toner supplying roller ... after the toner supplying operation”. The controller switches the level of the bias voltage applied to the cleaning unit so that the directions of the electric fields acting on the toner, formed between the toner supplying roller and the cleaning unit, after switching are opposite to those formed during development. Therefore, this configuration enhances the toner removal effect of excluding the toner from the nip between the cleaning unit 45 and the toner supplying roller 42. Note column 8, lines 16-44. This is shown in Fig. 12B.

5. Claim 25

Applicant argues that Sakai does not teach or suggest “removing the toner remaining on a toner supplying roller with a cleaning roller”, as recited by claim 25. Examiner disagrees. Although Sakai teaches the cleaning roller 45 is provided to supply the toner to the supplying roller 42, it is only during the time of development that this is true, shown in Fig. 12A (note column 24, lines 1-45). After development, there will be toner left remaining on developing roller 41 at its nip with toner supplying roller

Art Unit: 2852

42 (note column 25, lines 1-18). This may cause the toner to stick at that area, thus interfering with charging of the toner further making the development worse for the next operation. In order to eliminate this, the bias voltages applied to the toner supplying roller 42 and cleaning unit 45 are switched, reversing the direction of the electric fields that drive the toner at a period after development. This results in toner being efficiently removed by cleaning unit 45 between the contact point of cleaning unit 45 and toner supplying roller 42 as well as the contact point of cleaning unit 45 and regulating roller 43. Note column 25, line 1 – column 26, line 14. In addition, Sakai describes that after development, “the toner **residing** between the developing roller and the toner supplying roller ... can be positively removed and hence the toner that is trapped is excluded” (note column 8, lines 15-27). This toner **residing** between the developing roller and the toner supplying roller reads on the instant invention’s “toner remaining on a toner supplying roller”. The controller switches the level of the bias voltage applied to the cleaning unit so that the directions of the electric fields acting on the toner, formed between the toner supplying roller and the cleaning unit, after switching are opposite to those formed during development. Therefore, this configuration enhances the toner removal effect of excluding the toner from the nip between the cleaning unit 45 and the toner supplying roller 42. Note column 8, lines 16-44. This is shown in Fig. 12B.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2852


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan S. Lee whose telephone number is 571-272-2137. The examiner can normally be reached on Mon. - Fri., 10:30-8:00, Second Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Gray can be reached on 571-272-2119 or 571-272-2800 (Ext. 52). The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2852

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Susan S. Lee
Primary Examiner
Art Unit 2852

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